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Ontario. Public health engineering
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Bulletin

No. 164-165

Government
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March, 1969.

DEPARTMENT OF HEALTH

PUBLIC HEALTH ENGINEERING SERVICE

BULLETIN NO. 164

Re: Ontario Regulation No. 365/66
Relating to the Discharge of Sewage
in and from Pleasure Boats

Government
Publications

Prepared by: Ontario Water Resources Commission

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INTRODUCTION

The Ontario Water Resources Commission (OWRC) is the agency entrusted with the task of management of the water resources for the Province, and is the supervisory authority of all surface and ground water in Ontario as a source of water supply.

Even before the Commission was established, complaints were received at all levels of government on pollution and objectionable conditions caused by sewage and garbage being discharged from boats.

When occupied, all watercraft are potential sources of sewage and garbage. If this material is dumped overboard and sinks to the bottom, it is usually promptly forgotten. If it floats, it can pollute the water, and will continue to be a nuisance to property owners or bathing beach operators and patrons. It may even be a menace to other watercraft which frequently travel at high speeds.

Editorials and newspaper articles have appeared commenting on the growing pollution problems associated with boats and its effect on the recreation and other legitimate uses of our lakes, rivers and shores.

For years, recreationists, conservationists and others have reported and complained of pollution problems related to watercraft.

DISCHARGE PROHIBITED

Although the discharge of polluting material into the waterways of the Province is a violation of The Ontario Water Resources Commission Act, the Commission did not have authority to draw up specific regulations in the boat pollution field, until certain sections were passed in 1964 as an amendment to the Act. These sections provide for the control of pollution from boats.



STUDY BY COMMITTEE

Early in 1965, a technical report on "Marine Toilet Disposal Facilities" was submitted to an OWRC committee which was appointed to look into boat and marina sanitation.

The purpose of this report was to present the means available to boat owners for the prevention or treatment of marine toilet discharges, and to explain the relative merits and drawbacks of each system, i.e. macerator chlorinator treatment, holding tank and incineration.

On the basis of this report and other information received on the subject of boat sanitation, a regulation providing for the control of the discharge of sewage in pleasure boats and from pleasure boats into any water in the Province was made and approved under the OWRC Act in November, 1966.

PROVISION OF LEGISLATION

The Regulation, which went into effect on January 1, 1969 provides that any Ontario resident who owns a pleasure boat that has sleeping accommodation must equip his boat with an approved device for the storage or disposal of sewage of faecal origin. Macerator chlorinators or similar discharge-type devices will be allowed if a temporary permit is obtained from the OWRC. Temporary permits contain specified terms and conditions regarding operation of the device. In no case are these permits valid beyond June 1, 1971.

Owners or operators of all pleasure boats must ensure that the boat, while in any water, is equipped with containers (such as a litter bag) suitable for the storage of garbage and litter, etc. and that such garbage is retained on board in these containers until such time as it can be lawfully discharged or deposited ashore.

A pleasure boat is defined as "a boat that is used for pleasure and does not carry goods or persons for hire or reward, and includes a boat chartered or hired by or on behalf of the persons carried therein."

Boatmen from jurisdictions outside Ontario can meet the Ontario requirements if the sewage equipment on their boats complies with existing or pending requirements in their home jurisdictions and if these requirements are compatible with those of Ontario (i.e. prohibit overboard discharge). Where there are no home-base regulations in existence or pending, visitors must comply with the Ontario Regulation in the same way as an Ontario resident.

SHORE-BASED SEWAGE PUMP-OUT AND DISPOSAL FACILITIES

Also in 1965, a report on the role of marinas in the control of pollution from pleasure craft was submitted to the OWRC Committee. In the preparation of this report, the Commission found that the opinion of marina operators regarding the installation of dockside pumping and disposal facilities was mixed.

In May of 1967, a survey of marinas was commenced by OWRC staff to determine the operators' intentions with regard to the voluntary provision



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of on-shore facilities. In this original survey and in continuing field visits made since, a number of marina operators indicated that they would provide pump-out service. At the time of writing, approximately 70 marina operators had indicated plans to install facilities for the 1969 boating season.

The sewage pumped from boats will be disposed of by means of private septic tank systems, municipal sewage works and possibly in some cases by lagooning. Attention is directed to Section 14 of Schedule B of The Public Health Act, which applies, and states:

"No privy-vault, cesspool, septic tank or reservoir into which a privy, water-closet, stable or sink is drained shall be established until the approval in writing of the medical officer of health has been obtained. R.S.O. 1960, c. 321, Sched. B."

All pleasure boats located upon the waters of Ontario will be subject to inspection by the OWRC or any lawfully designated agency thereof at any time for the purpose of determining whether such watercraft are equipped in compliance with the Regulation.

Fines up to \$500.00 are provided for violation of the Regulation.

GENERAL GUIDELINES

For boatmen who may wish to install a system of their own design, some general guides are outlined as follows:

1. Tank Material -

The tank may be a plastic material which is resistant to acid, alkali and water, or stainless steel with comparable resistance.

2. Tank Capacity -

If no recirculation is provided, the recommended minimum tank capacity in gallons should be 2.5 times the passenger rating or 20 gallons, whichever is the greater.

The tank should be equipped with a sewage level device which either actuates a warning light when the tank becomes three-fourths full or in some other manner indicates the level of the sewage in the tank.

3. Waste and Vent Piping -

Waste and vent piping may be galvanized steel, wrought iron, lead, brass, copper or flexible or rigid plastic pipe. Waste

piping should be approximately 1-1/2 inches in diameter; vent piping should be approximately 7/8 inches in diameter.

The vent pipe should terminate with an inverted U-Bend, the opening of which is above the maximum water level in the head or sewage holding tank. If the storage tank receives the discharge from a pump type head, the tank vent pipe should be provided with a combined air and vacuum float valve of a design to prevent discharge of liquid waste.

4. The terminal of the outlet pipe should be located above the holding tank in a manner that makes impractical gravity discharge of the contents. It should have an air-tight capping device marked "Waste" or such word should be provided on the boat surface immediately adjoining the outlet pipe.
5. In regard to deck pump-out fittings, no firm standard has yet been established. From our perusal of published technical and catalogue data, however, we can safely say that most marine head and holding tank equipment is manufactured with 1-1/2 inch iron pipe size connections.



DEPARTMENT OF HEALTH

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PUBLIC HEALTH ENGINEERING SERVICE

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April, 1969.

BULLETIN NO. 165REGULATION PERTAINING TO CONTROL OF POLLUTION
FROM WATERCRAFT

Prepared by: R. C. Ballance, P.Eng.

The recent passage into law, effective January 1, 1969, of Ontario Regulation 365/66 relates to the control of pollution from watercraft. This regulation requires installation of sewage and waste collection and storage equipment in boats; it also permits treatment under certain conditions. There is, however, an inevitable effect of this which will reflect on the work of the Health Units and the Department of Health. This develops because of the need to pump out the holding tanks in the boat, and to dispose of, in some way, the faecal and other waste materials which are removed.

The Public Health Engineering Service has been asked to comment on the type of disposal systems which would be appropriate for pump-out stations. It has been generally pre-supposed that a disposal system would be located in association with a marina or similar docking facility. Consequently, it is inevitable that the pump-out station would be at water side and, ideally, would discharge to a municipal sewerage system, but more often than not, at a location at which it may be very difficult to install a normal septic tank system. But, there is a danger that these pump-out stations could generate a condition which is far worse than the condition they were intended to correct. That is, the concentrations of wastes in a marginally acceptable disposal system very close to the water's edge could result in the eventual transmission of wastes to the lake or river along the shore. Shore pollution and adverse conditions could therefore result quite easily.

Some of the medical officers of health have asked us for an opinion on the type of disposal facilities which would be appropriate. We repeat the suggestions we have made in reply to the specific requests. It should be noted that the comments which follow can be just as well applied to systems which are installed for the dumping of wastes from travel trailers.

First of all we should recognize that a substantial number of boat and trailer systems may use some type of chemical toilet. A large variety of chemicals for this use are commonly available. Alkalies and organic acids are not as common now as they were some years ago -- these were intended to decompose the solid materials but their use became unpopular because of the deterioration of the containers as well as the possibility of burns from splashing on the skin or clothing. Most of the chemicals in current use preserve rather than decompose the solids. Some chemical formulations contain formaldehyde, potassium, chlorine, chlorinated phenols or other coal tar derivatives. Invariably the ingredients contain

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odour-masking chemical -- pine oil is popular. A number of the compounds use a colour-changing chemical which indicates weakening of the chemical strength.

One manufacturer reports that a ten times dilution of the toilet waste with other domestic wastes renders the chemical waste amenable to biological treatment. It is safe to assume that, if such dilution were available in the septic tank and tile bed system, there would be no problem.

As stated above, the best arrangement for disposal of wastes from boats and trailers would be discharge into a municipal sewer system where dilution and mixing of the wastes with the normal sewage flow would take place. This assumes, of course, that the terminus of the sewer is at a treatment plant which can provide satisfactory treatment of the wastes to prevent pollution. Practically speaking, such an arrangement will probably be the exception rather than the rule.

The next best arrangement recognizes that a sewer system will not usually be adjacent to the marina or trailer dump station. Wastes can be discharged to a holding tank which can be emptied periodically and the contents trucked away for final disposal. Final disposal could take a variety of forms, the most likely of which would be discharge to a sewer, to a sludge lagoon, or to a sanitary landfill. There has been some experience of disposal of sludge in this latter manner. The general procedure is to spread the sludge immediately over the refuse prior to back-filling. There has also been some experience with spreading sludge on the ground and, after initial drying, plowing it under. The sludge lagoons are not uncommon. Any of the land disposal methods can produce nuisance conditions and must be located far enough away from population centres that they will not be obnoxious. It goes without saying that careful control must be exercised.

In some circumstances a septic tank and tile field system will be adequate. A considerable amount of extra care in the design, however, should be exercised. There are a number of reasons for this among which are the possible presence of chemicals, the probability of surges in the tank when wastes are being discharged, a considerably higher than usual concentration of solid material, no prior experience as to the volume of wastes which will be discharged, the location of the septic tank system (for marinas) adjacent to a lake or a river, and so forth. Two, or possibly three compartment tanks with siphon chamber would be desirable. Tile fields will have to be adequately sized and the percolation characteristics of the soil will be of vital importance. The general recommendations contained in the booklet "Septic Tank Systems" should apply, particularly as they refer to the thickness of soil above either rock or the ground-water table. In choosing tank dimensions it would be better to be on the safe side and require large tanks. This position is well justified since no one can give any reliable indication of the hydraulic and organic loadings to which the tanks will be subjected. This applies equally to the tile fields. One favourable factor is the probable long-resting period -- probably eight months -- for the tile field and this should be of great assistance in rejuvenating the soil. Systems, especially at marinas, should be watched closely for sludge build-up, and the tanks should be pumped out as often as is necessary. Sludge accumulation will be more critical than in usual water carriage systems. Normal sewage has a

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solids concentration of only about 0.06% maximum while in chemical toilets and toilets which use low quantities of water the solids concentration can be as high as 20% to 30%. Such a solids loading certainly suggests rapid sludge accumulation and would lead to frequent pump-out.

Summarizing the foregoing, we would recommend, in order of merit:

1. Discharge to a sanitary sewer which drains to a regular sewage treatment plant,
2. Holding in a tank for periodic removal by tank truck. Adequate final disposal is vital as also is effective control to prevent unauthorized discharge,
3. If dilution with at least ten parts of domestic sewage is possible, septic tank treatment will be effective. A good installation including a large tank siphon and a large tile field, together with good operation, frequent inspection and pump-out is vital.

There is no one answer to cover all combinations of situations peculiar to any particular project. The Public Health Engineering Service will be pleased to give any assistance possible in the consideration of specific proposals.

